**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**
**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re the Application of: **Kazuo TESHIROGI et al.** Group Art Unit: **1733**

Serial No.: **10/718,653** Examiner: **John L. GOFF**

Filed: **November 24, 2003** Confirmation No.: **1182**

For: **Film Lamination Apparatus And Method And A Manufacturing Method Of A Semiconductor Apparatus**

Attorney Docket Number: **032131**
Customer Number: **38834**

**SUBMISSION OF APPEAL BRIEF**

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

January 17, 2008

Sir:

Applicants submit herewith an Appeal Brief in the above-identified U.S. patent application.

Attached please find a check including the amount of $510.00 to cover the cost for the Appeal Brief.

If any additional fees are due in connection with this submission, please charge our Deposit Account No. 50-2866.

Respectfully submitted,

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

# APPEAL BRIEF FOR THE APPELLANT

Ex parte **Kazuo TESHIROGI et al.** (applicant)

## FILM LAMINATION APPARATUS AND METHOD AND A MANUFACTURING METHOD OF A SEMICONDUCTOR APPARATUS

Serial Number: **10/718,653**

Filed: **November 24, 2003**

Appeal No.:

Group Art Unit: **1733**

Examiner: **John L. GOFF**

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Date: January 17, 2008

# BRIEF ON APPEAL

## (I) REAL PARTY IN INTEREST

The real parties in interest are **FUJITSU LIMITED**, by an assignment recorded in the U. S. Patent and Trademark Office on November 24, 2003, at Reel 014739, Frame 0434.

## (II) RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to appellant, appellant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

## (III) STATUS OF CLAIMS

Claims 1-18 are pending. Claims 1-3, 15 and 18 stand rejected. Claims 4-14, 16 and 17 have been withdrawn from consideration. No other claims are pending. No other claims have been allowed. The claims on appeal are 1-3, 15 and 18.

## (IV) STATUS OF AMENDMENTS

No amendments have been filed subsequent to final rejection.

## (V) SUMMARY OF CLAIMED SUBJECT MATTER

The present invention, independent claim 1 is directed to a film lamination method for laminating a film on a principal surface of a semiconductor substrate. The film lamination method in claim 1 uses a rotatable roller having a diameter of about 20-50 mm, a heat-generating part therein and an elastically deformable resin layer on an outer surface thereof. See page 15, line

5 to line 18 of the specification, as well as FIG. 4 of the drawings. As described in page 15, line 22 to page 18, line 5 of the specification, the roller is pressed onto the film on a principal surface of a semiconductor substrate, and is rolled on the film so as to laminate the film on the semiconductor substrate. The elastic deformation of the elastically deformable resin layer absorbs unevenness of the outer surface of the roller and unevenness of a surface of the film. The roller presses the film with a pressing load of 10-20N, and the heating part is heated to about 200°C. As described in page 21, line 5 to line 8 of the specification as well as FIG. 7 of the drawings, about 5 seconds after the roller is pressed an area of the principal surface of the semiconductor substrate, the area returns to a temperature about equal to the area's temperature prior to contact with the roller. Dependent claims 2-3 and 18 rise and fall with parent claim 1.

Independent claim 15 is directed to a manufacturing method of semiconductor device. Similar to the embodiment encompassed by claim 1 above, the manufacturing method of semiconductor device in claim 15 also uses the rotatable roller. As described in page 1, line 16 to line 29 of the specification, the principal surface of a semiconductor substrate is grinded so as to thin the semiconductor substrate, and the semiconductor substrate is individualized into a plurality of semiconductor elements. As described in page 15, line 22 to page 18, line 5 of the specification, an attachment film is applied onto the principal surface of a semiconductor substrate. The roller is pressed onto the film on a principal surface of a semiconductor substrate, and is rolled on the film so as to laminate the film on the semiconductor substrate. The elastic deformation of the elastically deformable resin layer absorbs unevenness of the outer surface of the roller and unevenness of a surface of the film. The roller presses the film with a pressing load of 10-20N, and the heating part is heated to about 200°C. As described in page 21, line 5 to line 8 of

the specification as well as FIG. 7 of the drawings, about 5 seconds after the roller is pressed an area of the principal surface of the semiconductor substrate, the area returns to a temperature about equal to the area's temperature prior to contact with the roller.

## (VI) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-3 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over ***Nagatomi et al.*** (JP 54124968 and the abstract) in view of either one of ***Inada et al.*** (JP 06104317 and the abstract) or ***Shoffner et al.*** (U.S. Patent No. 3,749,621), ***Da Costa et al.*** (U.S. Patent No. 3,040,489), either one of ***Tsunashima et al.*** (U.S. Patent No. 5,051,475) or ***Homma et al.*** (U.S. Patent No. 5,336,703), and optionally ***Pool et al.*** (U.S. Patent No. 3,501,128).

Claim 15 stand rejected under 35 U.S.C. §103(a) as being unpatentable over ***Nagatomi et al.***, either one of ***Inada et al.*** or ***Shoffner et al.***, ***Da Costa et al.***, either one of ***Tsunashima et al.*** or ***Homma et al.***, and optionally ***Pool et al.*** as applied to claims 1-3 and 18 above, and further, in view of the admitted prior art (Specification pages 1-3).

## (VII) ARGUMENT

**(a) Appellant's argument as to the rejection of Claims 1-3 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Nagatomi et al.* (JP 54124968 and the abstract) in view of either one of *Inada et al.* (JP 06104317 and the abstract) or *Shoffner et al.* (U.S. Patent No. 3,749,621), *Da Costa et al.* (U.S. Patent No. 3,040,489), either one of *Tsunashima et al.* (U.S. Patent No. 5,051,475) or *Homma et al.* (U.S. Patent No. 5,336,703), and optionally *Pool et al.* (U.S. Patent No. 3,501,128)**

Claims 1-3 and 18 are not obvious within the meaning of 35 U.S.C. §103(a) as being unpatentable over ***Nagatomi et al.* (JP 54124968 and the abstract)** (hereinafter "***Nagatomi et al.***") in view of either one of ***Inada et al.* (JP 06104317 and the abstract)** (hereinafter "***Inada et al.***") or ***Shoffner et al.* (U.S. Patent No. 3,749,621)** (hereinafter "***Shoffner et al.***"), ***Da Costa et al.* (U.S. Patent No. 3,040,489)** (hereinafter "***Da Costa et al.***"), either one of ***Tsunashima et al.* (U.S. Patent No. 5,051,475)** (hereinafter "***Tsunashima et al.***") or ***Homma et al.* (U.S. Patent No. 5,336,703)** (hereinafter "***Homma et al.***"), and optionally ***Pool et al.* (U.S. Patent No. 3,501,128)** (hereinafter "***Pool et al.***") because the references fail to set forth a required element present in claim 1. Namely, the prior art does not provide a teaching of or a reason why one of skill in the art would utilize a rolling method whereby about 5 seconds after the roller is pressed to an area of the principal surface of the semiconductor substrate the area returns to a temperature about equal to the area's temperature prior to contact with the roller. Claims 2-3 and 18 are likewise not obvious by nature of their dependency.

In the present instance, the Examiner has not properly construed the limitations of claim 1 which state in relevant part:

> ...rolling the roller on the film so as to laminate the film on the semiconductor substrate by heat only from the heat-generating part.....
> .....
> wherein said roller presses the film with a pressing load of 10-20N;
> wherein the heat-generating part is heated to about 200°C; and
> about 5 seconds after the roller is pressed to an area of the principal surface of the semiconductor substrate said area returns to a temperature about equal to the area's temperature prior to contact with the roller.

The Final Office Action issued October 17, 2007 responds to Applicants' earlier Amendment setting forth this limitation as a distinguishing feature on page 5, line 14 to Page 6, line 2 of the Office Action states:

> ...Additionally, as the materials and method taught by Nagatomi et al. as modified by either one of Inada et al. or Shoffner, DaCosta, either one of Tsunashima et al. or Homma et al., and optionally Pool is consistent and in agreement with that claimed and described by applicants as resulting in about 5 seconds after the roller is pressed to an area of the principal surface of the semiconductor substrate said area returns to a temperature about equal to the area's temperature prior to contact with the roller one of ordinary skill in the art at the time the invention was made would have readily expected the method taught by Nagatomi et al. as modified by either one of Inada et al. or Shoffner, Da Costa, either one of Tsunashima et al. or Homma et al., and optionally Pool to result in the same. In the event it is shown the depiction about 200°C in Nagatomi et al. is not a specific disclosure the following rejection would apply.

Further, the Final Office Action issued October 17, 2007 responds to Applicants' earlier Amendment setting forth the above underlined limitation as a distinguishing feature from on page 8, line 1 to line 11 of the Office Action states:

> ...The new limitations are addressed above it being noted no generation of cracking of the semiconductor substrate is considered to follow from Nagatomi et al. as modified by either one of Inada et al. or Shoffner, Da Costa, either one of Tsunashima et al. or Homma et al., and optionally Pool as Nagatomi et al. teach applying heat to laminate the film on the semiconductor substrate only from the heat-generating part heated to about 200°C wherein one of ordinary skill in the art would readily expect the roller including heat-generating part taught by Nagatomi et al. rolled over the semiconductor substrate to function in an analogous manner to the roller including heat-generating part rolled over the semiconductor substrate claimed and disclosed by applicant, i.e. about 5 seconds after the roller is pressed to an area of the principle surface of the semiconductor substrate said area returns to a temperature about equal to the area's temperature prior to contact with the roller.

The Examiner does not cite to the texts of ***Nagatomi et al.***, either one of ***Inada et al.*** or ***Shoffner et al.***, ***Da Costa et al.***, either one of ***Tsunashima et al.*** or ***Homma et al.*** and optionally

***Pool et al.***, which the Examiner relies on for the above interpretation and rejection of the above underlined limitation of claim 1.

***Nagatomi et al.*** teaches only scribing the semiconductor substrate after pressure-welding with heating by a heating element at a fixed temperature. A heating roller 15a provided internally with electric heater 15c with rotation support axes 15b and 15b' as lead-out electrodes is mounted on sheet 4, and sheet 4 is pressure-welded to substrate 3 while roller 15a is controlled by temperature controller 6 externally arranged to a fixed temperature (Abstract). ***Nagatomi et al.*** is the primary reference relied upon by the Examiner in making the rejection.

***Inada et al.*** teaches only TAB tape having an insulating tape. A bonding agent is applied to the entire area of the upper surface of the insulating tape, and metallic foil is stuck to the central part of the tape by means of a heated pressing roll except both side sections, and the surface of the pressing roll is coated with a Teflon film (Abstract). ***Inada et al.*** is not directly related to the semiconductor dicing art, but is relied upon by the Examiner for teaching a Teflon film.

***Shoffner et al.*** teaches only the concept of securing and/or forming of coverings of fluorinated ethylene polymer (FEP) materials. The core element to be covered is typically a metallic cylindrical roller 10, and the heat-sealable thermoplastic cover is executed fluorocarbon thermoplastic tube 9 of smaller initial diameter than the roller (Column 3, line 74 to Column 4, line 3). ***Shoffner et al.*** is not related to the semiconductor dicing art, but is relied upon by the Examiner for teaching a Teflon film.

***Da Costa et al.*** is from 1959 and only teaches the formation of semiconductor elements or dice for use in the manufacture of semiconductor devices. The roller assembly includes an

arm 57 serving as the axis for the roller, and such arm in turn is mounted rigidly in an arm 58 which is provided at 59 to an axis member 61 mounted on the machine. The roller 52 is of hard steel or bronze, and for one embodiment of this invention is 11/4 inches in diameter and of a width sufficient to overlap the outer edges of the slab 25' (Column 6, line 15 to line 21). ***Da Costa et al.*** is relied upon by the Examiner for teaching a diameter of a roller.

***Tsunashima et al.*** teaches only a polyester film comprising at least at its surface portion oriented sulfonic acid groups and/or salts thereof with an orientation degree of 5-100, which has an adhesiveness, specifically an anti-alkaline adhesiveness. The tape was pressed with a hand roller with a force of about 5 kg, which hand roller was moved back and forth 10 times, to pressure-stick the cellphane tape (Column 8, line 40 to line 43). ***Tsunashima et al.*** is not related to the semiconductor dicing art, but is relied upon by the Examiner for teaching a pressing load.

***Homma et al.*** teaches a two-pack type curable composition comprising an epoxy resin and an organic elastomeric polymer. A pair of the same plates coated with the mixture were laminated with facing the coated surfaces to each other and pressed five times by moving a hand roller with 5 kg of load along the length in one direction (Column 13, line 40 to line 44). ***Homma et al.*** is not related to the semiconductor dicing art, but is relied upon by the Examiner for teaching a pressing load.

***Pool et al.*** teaches only ball type valves and particularly to improvements in elastically deformable ball valve members. Suitable materials for forming ball sleeve 42 and which are regarded as being elastically deformable are, for example, urethane, rubber or Teflon (Column 3, line 33 to line 35). ***Pool et al.*** is not related to the semiconductor dicing art, but is relied upon by the Examiner for teaching a Teflon film.

Under U.S. law, as quoted in the M.P.E.P. §2141.III.:

> The key to supporting any rejection under 35 U.S.C. 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. The Supreme Court in *KSR* noted that the analysis supporting a rejection under 35 U.S.C. 103 should be made explicit. The Court quoting *In re Kahn,* 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006), stated that "'[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.'" *KSR*, 550 U.S. at ___, 82 USPQ2d at 1396.

The Examiner's reasoning for why it would have been obvious to combine the four to five references is set forth in two summary statements:

> ...one of ordinary skill in the art at the time the invention was made would have readily expected the method taught by Nagatomi et al. as modified by either one of Inada et al. or Shoffner, Da Costa, either one of Tsunashima et al. or Homma et al., and optionally Pool to result in the same....
>
> ...wherein one of ordinary skill in the art would readily expect the roller including heat-generating part taught by Nagatomi et al. rolled over the semiconductor substrate to function in an analogous manner.
>
> See Office Action at *Id.*

However, there is no cited teaching from any of the references as to why one of skill in the art would make the combination to utilize a rolling method whereby about 5 seconds after the roller is pressed to an area of the principal surface of the semiconductor substrate the area returns to a temperature about equal to the area's temperature prior to contact with the roller. In other words, there is no reason provided by the Examiner why the skilled artisan would make the combination in the first place to derive the "readily expected" result. As set forth in *Takeda v. Alphapharm* 492 F.3d 1350, 1356-1357; 83 USPQ2d 1169 (Fed. Cir. 2007):

> While the *KSR* Court rejected a rigid application of the teaching, suggestion, or motivation ("TSM") test in an obviousness inquiry, the Court acknowledged the importance of identifying "a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does" in an obviousness determination. *KSR*, 127 S. Ct. at 1731.

In other words, ***Nagatomi et al.***, either one of ***Inada et al.*** or ***Shoffner et al.***, ***Da Costa et al.***, either one of ***Tsunashima et al.*** or ***Homma et al.***, and optionally ***Pool et al.*** are not suggesting "...wherein said roller presses the film with a pressing load of 10-20N; wherein the heat-generating part is heated to about 200°C; and about 5 seconds after the roller is pressed to an area of the principal surface of the semiconductor substrate said area returns to a temperature about equal to the area's temperature prior to contact with the roller," as the Examiner states.

There is no reason whereby one of skill in the art would have combined the references to derive the current invention. ***Nagatomi et al.*** was filed in March 23, 1978. The wafers in 1978 were very thick so that there was no need to consider the cracking of the semiconductor substrate which is caused by the thermal stress. ***Nagatomi et al.*** considers only the appropriate adsorptive property of the sheet to the semiconductor substrate and the evenness of the surface of the semiconductor substrate. One of skill in the art at the time the present invention was made would readily understand this inapplicability of the reference to modern semiconductor wafers. As shown in FIG. 1 to 5 in ***Nagatomi et al.***, the roller of ***Nagatomi et al.*** is controlled by manual not automatically. The manual controlled roller in ***Nagatomi et al.*** cannot control the pressing load to maintain 10-20N. Since ***Nagatomi et al.*** does not need to consider thermal stress, ***Nagatomi et al.*** does not need to consider the pressing load of the roller. Still further, as evidenced by the figures of ***Nagatomi et al.*** the ratio of the roller size to wafer size is very small. In other words, the roller covers a large area of the wafer at any one time. Clearly in such a configuration, thermal difference of one area of the wafer as compared to another is not a concern. As noted above, none of the other cited references except ***De Costa et al.***, are directed to semiconductor dicing. Hence, none of these references provide any reason for a method utilize a

roller whereby about 5 seconds after the roller is pressed to an area of the principal surface of the semiconductor substrate the area returns to a temperature about equal to the area's temperature prior to contact with the roller.

To the contrary, in the modern semiconductor manufacturing process, the wafers are very thin. Therefore, the present invention needs to consider the cracking of the semiconductor substrate which is caused by the thermal stress due to differences in temperature between different areas of the wafer. Since the present invention is subject to thermal stress, the present invention also needs to consider the pressing load of the roller. The present invention according to claims 1-3 and 18 applies the non-manual control of the pressing load so that the pressing load maintains 10-20N. Therefore the ratio of the roller size to wafer size is very large. Under the non-manual pressure control of the pressing load, as shown in FIG. 7, the present invention teaches that "about 5 seconds after the roller is pressed to an area of the principal surface of the semiconductor substrate said area returns to a temperature about equal to the area's temperature prior to contact with the roller." Page 20, line 34 to Page 21, line 21 of the specification states:

> Although cracking in the semiconductor substrate was expected when the temperature of the semiconductor substrate exceeded 60 °C, according to the graph of FIG. 7, an area of the semiconductor substrate in which the temperature rises up to 60°C is limited to an area within about 5 mm from the heat source (heater). Thus, an actually heated area is small and the semiconductor substrate is merely heated locally. Moreover, when the heat source is separated away from the semiconductor substrate, the temperature to the semiconductor substrate returns to a normal temperature in about seconds...
>
> That is, since the semiconductor substrate is locally heated by the pressing roller, the thermal expansion of the semiconductor substrate occurs locally. Thus, the thermal stress is relaxed by other portions of the semiconductor substrate, and there is no thermal stress which may cause cracking of the semiconductor substrate.

The present invention, as claimed in claim 1, includes the features: "wherein said roller presses the film with a pressing load of 10-20N; wherein the heat-generating part is heated to about 200°C; and about 5 seconds after the roller is pressed to an area of the principal surface of the semiconductor substrate said area returns to a temperature about equal to the area's temperature prior to contact with the roller." As mentioned above, these features produce a result which cannot be expected from ***Nagatomi et al.***, "there is no generation of cracking of the semiconductor substrate which is caused by the thermal stress." Hence, there is no reason whereby one of skill in the art would be motivated to combine the references to derive the currently claimed invention.

For at least the foregoing reasons, the honorable Board is respectfully requested to reverse the rejections maintained by the Examiner.

**(b) Claim 15 stands rejected under 35 U.S.C. §103(a) as being unpatentable over *Nagatomi et al.*, either one of *Inada et al.* or *Shoffner et al.*, *Da Costa et al.*, either one of *Tsunashima et al.* or *Homma et al.*, and optionally *Pool et al.* as applied to claims 1-3 and 18 above, and further, in view of the admitted prior art (Specification pages 1-3)**

Claim 15 is not obvious within the meaning of 35 U.S.C. §103(a) as being unpatentable over ***Nagatomi et al.***, either one of ***Inada et al.*** or ***Shoffner et al.***, ***Da Costa et al.***, either one of ***Tsunashima et al.*** or ***Homma et al.***, and optionally ***Pool et al.*** because the references fail to set forth a required element present in claim 15.

The Final Office Action issued October 17, 2007 responds to Applicants' earlier Amendment setting forth this limitation as a distinguishing feature at page 7, line 5 to line 8 of the Office Action states:

> ...Nagatomi et al., either one of Inada et al. or Shoffner, Da Costa, either one of Tsunashima et al. or Homma et al., and optionally Pool as described above teach all of the limitations in the claim 15, and further, in view of the admitted prior art (Specification pages 1-3).

The rejection regarding claim 15 is similar to the rejection regarding claims 1-3 and 18. However, claim 15 includes the additional feature: "grinding another principal surface of the semiconductor substrate so as to thin the semiconductor substrate." This feature emphasize that the present invention produces a result which is not expected from ***Nagatomi et al.***, namely, "there is no generation of cracking of the semiconductor substrate which is caused by the thermal stress." Further, assuming such a combination was made, the result would only be the devices set forth in the admitted prior art at pages 1-3 of the specification; specifically, a roller system causing cracking due to thermal stress. In other words, the 1978 roller system of ***Nagatomi et al.***, and the 1959 roller system of ***DeCosta et al.*** do not add anything to the disclosure at pages 1-3 of the specification.

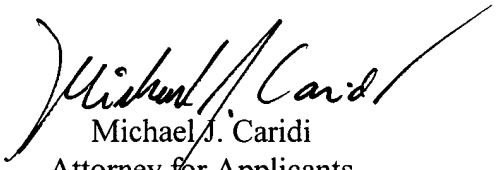
From the same basis detailed above in regard to claim 1, there is no reason provided whereby one of skill in the art would combine ***Nagatomi et al., DeCosta et al.,*** page 1-3 of the specification and the remaining non-analogous art to derive the currently claimed invention.

For at least the foregoing reasons, the honorable Board is respectfully requested to reverse the rejection of claim 15 maintained by the Examiner.

In the event this paper is not timely filed, appellants hereby petition for an appropriate extension of time. The fee for any such extension may be charged to our Deposit Account No. 50-2866, along with any other additional fees which may be required with respect to this paper.

Respectfully submitted,

**WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP**



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## (VIII) CLAIM APPENDIX

1. (Previously presented): A film lamination method for laminating a film on a principal surface of a semiconductor substrate by using a rotatable roller having a diameter of about 20-50mm, a heat-generating part therein and an elastically deformable resin layer on an outer surface thereof, the film lamination method comprising:

pressing the roller onto the film placed on the principal surface of the semiconductor substrate while generating heat by the heat-generating part;

rolling the roller on the film so as to laminate the film on the semiconductor substrate by heat only from the heat-generating part while absorbing unevenness of the outer surface of the roller and unevenness of a surface of the film by elastic deformation of the elastically deformable resin layer;

wherein said roller presses the film with a pressing load of 10-20N;

wherein the heat-generating part is heated to about 200°C; and

about 5 seconds after the roller is pressed to an area of the principal surface of the semiconductor substrate said area returns to a temperature about equal to the area's temperature prior to contact with the roller.

2. (Previously presented): The film lamination method as claimed in claim 1, wherein said roller includes a cylindrical metal body and a resin layer formed on an outer surface of the cylindrical metal member, and wherein the heat-generating part is provided in a central portion of the cylindrical metal member so as to extend in an axial direction of the cylindrical metal member.

3. (Original): The film lamination method as claimed in claim 2, wherein said resin layer is formed of a fluoride resin.

4. (Withdrawn): The film lamination method as claimed in claim 1, wherein said roller is a cylindrical elastic member, and a plurality of heat-generating parts are arranged near an outer

surface of the cylindrical elastic member.

5. (Withdrawn): The film lamination method as claimed in claim 4, wherein said cylindrical elastic member is made of rubber or plastic.

6. (Withdrawn): The film lamination method as claimed in claim 1, wherein said roller includes a plurality of short rollers each having a width smaller than a width of said semiconductor substrate, so that the film is laminated on the semiconductor substrate by pressing the plurality of short rollers sequentially on the film placed on the principal surface of the semiconductor substrate and rolling the short rollers on the film.

7. (Withdrawn): A film lamination method for laminating a film on a principal surface of a semiconductor substrate by using a table supporting the semiconductor substrate and a rotatable roller, the table having a plurality of heat-generating parts therein, the film lamination method comprising pressing the roller onto the film placed on the principal surface of the semiconductor substrate and rolling the roller on the film while selectively activating the heat-generating parts in response to a movement of the roller so as to laminate the film on the semiconductor substrate by heat from the heat-generating parts.

8. (Withdrawn): The film lamination method as claimed in claim 7, wherein said heat-generating parts are arranged so as to be parallel to a direction perpendicular to a laminating direction and thermally isolated from each other.

9. (Withdrawn): A film lamination method for laminating a film on a principal surface of a semiconductor substrate by using a rotatable roller and a table supporting the semiconductor substrate, a heat-generating part being movably provided under the table, the film lamination method comprising pressing the roller onto the film placed on the principal surface of the semiconductor substrate and rolling the roller on the film while moving the heat-generating part in response to a movement of the roller so as to laminate the film on the semiconductor substrate

by heat from the heat-generating part.

10. (Withdrawn): A film lamination apparatus comprising: a table on which a semiconductor substrate to be processed is placed and fixed; and a roller pressing an attachment film onto the semiconductor substrate while rolling on the attachment film, wherein said roller includes: a cylindrical metal member; a heat-generating part provided in the cylindrical metal member; and a resin layer covering an outer surface of said cylindrical metal member.

11. (Withdrawn): A film lamination apparatus comprising: a table on which a semiconductor substrate to be processed is placed and fixed; and a roller pressing an attachment film onto the semiconductor substrate while rolling on the attachment film, wherein said roller includes: a cylindrical elastic member; and a heat-generating part provided in the cylindrical elastic member.

12. (Withdrawn): A film lamination apparatus comprising: a table on which a semiconductor substrate to be processed is placed and fixed; and a roller assembly having a plurality of short rollers each pressing an attachment film onto the semiconductor substrate while rolling on the attachment film, wherein said roller assembly includes a plurality of heat-generating rods parallel to a direction perpendicular to a laminating direction, the heat-generating rods provided with cylindrical metal members, respectively, so that parts of the cylindrical metal members overlap with each other in an axial direction of the heat-generating rods.

13. (Withdrawn): A film lamination apparatus comprising: a table on which a semiconductor substrate to be processed is placed and fixed; a roller pressing an attachment film onto the semiconductor substrate while rolling on the attachment film; and a heat-generating part provided in said table, wherein the heat-generating part is divided in to a plurality of small heat-generating parts arranged in a direction of movement of the roller.

14. (Withdrawn): A film lamination apparatus comprising: a table on which a

semiconductor substrate to be processed is placed and fixed; a roller pressing an attachment film onto the semiconductor substrate while rolling on the attachment film; and a heat-generating part provided under said table, the heat-generating part being movable in response to a movement of said roller.

15. (Previously presented): A manufacturing method of a semiconductor device, comprising the steps of:

grinding another principal surface of the semiconductor substrate so as to thin the semiconductor substrate;

applying an attachment film onto the another principal surface of the semiconductor substrate; and

individualizing the semiconductor substrate into a plurality of semiconductor elements,

wherein the attachment film is laminated on the semiconductor substrate by pressing the attachment film placed on the another principal surface of the semiconductor substrate by a rotatable roller having a diameter of about 20-50mm, a heat-generating part therein and an elastically deformable resin layer on an outer surface thereof, and rolling the roller on the attachment film while generating heat by only the heat-generating part while absorbing unevenness of the outer surface of the roller and unevenness of a surface of the film by elastic deformation of the elastically deformable resin layer;

wherein said roller presses the film with a pressing load of 10-20N;

wherein the heat-generating part is heated to about 200°C; and

about 5 seconds after the roller is pressed to an area of the principal surface of the semiconductor substrate said area returns to a temperature about equal to the area's temperature prior to contact with the roller.

16. (Withdrawn): A manufacturing method of a semiconductor device, comprising the steps of: grinding another principal surface of the semiconductor substrate so as to thin the semiconductor substrate; applying an attachment film onto the another principal surface of the semiconductor substrate; and individualizing the semiconductor substrate into a plurality of

semiconductor elements, wherein the attachment film is laminated on the semiconductor substrate by pressing by a rotatable roller the attachment film placed on the another principal surface of the semiconductor substrate that is placed on a table provided with a plurality of heat-generating parts therein and rolling the roller on the attachment film while selectively causing the heat-generating parts to generate heat in response to a movement of the roller.

17. (Withdrawn): A manufacturing method of a semiconductor device, comprising the steps of: grinding another principal surface of the semiconductor substrate so as to thin the semiconductor substrate; applying an attachment film onto the another principal surface of the semiconductor substrate; and individualizing the semiconductor substrate into a plurality of semiconductor elements, wherein the attachment film is laminated on the semiconductor substrate by pressing by a rotatable roller the attachment film placed on the another principal surface of the semiconductor substrate that is placed on a table for supporting the semiconductor substrate and rolling the roller on the attachment film while moving a heat-generating part provided under the table in response to a movement of the roller, the heat-generating part generating heat while moving.

18. (Previously presented): The film lamination method as claimed in claim 1, wherein the difference in temperature between said heat generating part and said film during rolling is about 20°C.

(IX) EVIDENCE APPENDIX

No evidence under 37 C.F.R. § 41.37(c)(1)(ix) is submitted.

## *(X) RELATED PROCEEDING APPENDIX*

No decisions under 37 C.F.R. § 41.37(c)(1)(x) are rendered.